TOP SECRET

THE SIGNAL INTELLIGENCE SERVICE
OF THE
GERMAN LUFTWAFFE

VOL. VIII
MISCELLANEOUS STUDIES

TOP SECRET

VOL. VIII

MISCELLANEOUS STUDIES

LUFTWAFFE SIS

F O R E W O R D

The studies contained in this volume, and which cover various aspects of the operations of the Luftwaffe SIS, fall into three general categories:

a. Studies dealing with technical operations in a particular theatre of war, but deemed to be of such signifigance as to warrant special treatment in detail, rather than to be included in the history dealing specifically with technical operations in that theatre. Such, for example, are the studies on "Meldekopf 1", and "Early Warning".

b. Studies dealing with matters applicable to the Luftwaffe SIS as a whole, and in their nature, requiring consideration separate and apart. Such are the studies which treat of "Training", and "Women Auxiliaries".

c. Studies dealing with matters of liaison and co-operation between the Luftwaffe SIS, and other departments and sections of the Luftwaffe Headquarters. Such are indicated by their title.

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LUFTWAFFE SIS

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MELDEKOPF 1

By

Technical Sergeant Gerd Watkinson,
Duty Officer, Meldekopf 1, Luftwaffe SIS.

The idea of a Meldekopf, representing an instrument of liaison between the SIS and combat units, was first realized during the autumn of 1940 while the SIS was supporting the German fighter arm on the Channel Coast. At that time SIS succeeded in playing such an important role in the Battle of Britain, that combat aviation commanders chose, virtually, to control their fighter aircraft from the intercept room of the SIS.

When it was learned that the enemy was creating a strategic air force (RAF Bomber Command), the need for a "bomber" Meldekopf became apparent. Therefore, in the summer of 1942 there was created in Zeist, Holland, a bomber Meldekopf, consisting of officers, evaluators, and W/T operators from SIS units in the West. This bomber Meldekopf later became Meldekopf 1. The function of the Meldekopf was to observe and study the recently organized enemy bomber force, and to support the fighter arm in its endeavours to combat this threat. In order to counter the changing enemy combat tactics and radio procedure, flexibility in the organization and tactics of the SIS became of the essence.

The development of the Meldekopf can be divided into two distinct periods: initially, from the beginning of 1942 to the end of 1943, it refined its operational procedures, specializing at this time on early warning; finally from

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early 1944 to the end of the war, its main function became that of flight path tracking, and the presentation of a faultless and continuous picture of the air situation over the Reich.

This development of the Meldekopf was furthered by its talented evaluators, and its young, ambitious officers, who brought its operation to so high a degree of perfection that, at the beginning of 1944, SIS was in a position to accomplish the following:

a) To give accurate long and short interval early warning of both daylight and night raids of heavy bomber formations;

b) By continuously tracking heavy bomber formations, to present to the fighter defense a lucid picture of the air situation, from the time of take-off to the landing of the enemy formations; further,

c) To interpret the picture of the air situation in such a manner as to predict the enemy's strength of formations, depth of penetrations, targets, and deceptive tactics.

In order to attain such results, certain prerequisites in organization and modus operandi had to be met by both the Meldekopf and its subordinate units. They can be outlined as follows:

1. A Meldekopf, representing the essence of tactical evaluation, can not afford to become all-embracive in its SIS functions. Therefore, separate Meldekoepfe, specializing in different types of enemy air activity (heavy bomber, air support, long-range reconnaissance, etc.) were created. Another solution might have been to establish Meldekoepfe in fixed geographical areas, each Meldekopf handling all enemy air activity within its area. The ZAF, established

in the autumn of 1944, represented a compromise between these two concepts. As the central Meldekopf, dealing with heavy and medium bomber raids, there were subordinated to it, Meldekoepfe in the East, West and South, which dealt with this type of enemy air activity on a geographical basis.

2. The Meldekopf had to have access to all SIS and collateral material, which either directly or indirectly pertained to its particular task. It is evident, for example, that hints of the intentions of heavy bombers could be obtained from the radio traffic of their fighter cover. In the same manner, flights of heavy bombers over coastal areas could be determined from certain naval traffic ("Loxo" messages); and preparations on the part of the sea rescue fleet would often indicate an impending attack.

3. The Meldekopf had to be completely responsible for its own operational area, and therefore had to be given complete control of the SIS units serving it. The resourcefulness of the enemy compelled the Meldekopf to be equally ingenious in modifying its procedures; consequently it had to have full control of the operations of its intercept companies and D/F stations. The chief of the Meldekopf, and the operations officer of the battalion, had to work in the closest harmony; the ideal solution would have been the personal union of the two functions.

4. Only selected personnel could be employed by the Meldekopf. By a rational and consistant policy with respect to its choice of personnel, the Meldekopf succeeded in attaining a standard of perfection, which accounted for its leadership in the field of tactical signal intelligence. The following members of Meldekopf 1 will always be remembered for their outstanding performance:

Captain Rueckheim, chief of the Meldekopf, later battalion commandef.

1st Lieut. Martens, deputy, and later chief of the Meldekopf; also company commander of the evaluation company.

1st Lieut. Hickmann, evaluation officer; later chief of the ZAF.

2nd Lieut, Bofinger, radar intercept evaluation officer; also maintenance officer.

2nd Lieut. Henning, chief of final evaluation; later operations officer of the battalion.

2nd Lieut. Pauquet, duty officer, and VHF specialist.

Tech. Sergeant Haeberle, duty officer.

Tech. Sergeant Rauin, radar intercept evaluator.

Sergeant Trost, bomber code cryptanalyst.

5. The Meldekopf had to be set up where good signal communication (telephone and teletype facilities) either already existed, or were easy to install, both to its subordinate SIS units and to fighter defense headquarters, as well as to the CP's of individual combat units. With the latter, the Meldekopf attempted, from the very beginning, to maintain the closest contact. The Meldekopf was quick to realize that this consideration was pertinent to its success. It used all possible means, therefore, to educate these combat units to the importance and proper use of signal intelligence. This was accomplished principally through the creation of the post of signal intelligence liaison officers. In addition, personnel policy, together with regularly-scheduled conferences for the exchange of ideas, assured co-operation on the part of its subordinate SIS units.

As a result of the re-organization of the SIS in the West, in the middle of 1942, the 1st Battalion of the Regiment West, was assigned exclusively the

task of monitoring Allied heavy bomber traffic. Each of the three W/T intercept companies was responsible for the monitoring of definite heavy bomber units. Moreover, each company boasted its own traffic analysis section, which sought to solve tactical as well as strategic problems. The several out-stations (two HF R/T platoons, four radar intercept detachments, and three HF D/F's) were only operationally subordinate to the Meldekopf. Administratively they were subordinate to the various companies of the battalion, and, in some cases, even to companies of other battalions of the regiment. The first company comprised Meldekopf 1 (tactical evaluation section, plus a special W/T intercept platoon), a cryptanalysis section, and a final evaluation section.

All flash reports from the various intercept companies and out-stations were first collected in the tactical evaluation section of the Meldekopf, and then forwarded to the defense headquarters concerned, with a speed commensurate with their importance. The most important reports consisted of:

Prediction of raids

Position of the raiding bombers

Strength of the formations

Reports of aircraft crashed at sea

Reports of weather over England

Every evening a summary was made of the day's training traffic in England. The special W/T platoon of the Meldekopf monitored those frequencies on which, in those days, a heavy bomber raid was first reflected, i.e., those of the MF D/F sections and headquarters of the individual bomber groups, as well as certain radio beacons (Splasher).

The position (f) the bombers was most frequently determined from bearings taken on Allied IFF (Saegebock). Usually an approximate position only could be determined. But nevertheless, the probable area of penetration could be estimated, and the fighter defense given early warning of the course which the enemy formations would probably follow.

The final evaluation section produced the daily tactical report, the monthly report, and special reports. It also furnished technical data (call-signs, frequencies, etc.) to the traffic analysis sections at the intercept companies, and ~~the~~ to the out-stations. All intercepted bomber code messages were read in the cryptanalytic section. Those messages of a tactical import were immediately given to the tactical evaluation section; messages of a strategic nature were passed to the final evaluation section. A report containing the decodes of all deciphered material was prepared daily.

The capable officers and evaluators of Meldekopf 1, were certain that the existing organization (f) the battalion would be only temporary. The influence which the Meldekopf exercised over its SIS units was of uncertain stability since command of the battalion was in the hands of an officer inexperienced in the SIS. The successes of the Meldekopf only increased his determination to sabotage the efforts of energetic and conscientious officers. During this period, when tension prevailed throughout the battalion, and was further aggravated by an indecisive attitude on the part of the regimental commander, the expansion (f) the Allied strategic air forces, as well as the increased demands of the fighter arm resulting therefore, required another thorough re-organization of the battalion and Meldekopf. Matters now assumed such shape, that the battalion commander could no longer resist the demands of the

Meldekopf for complete authority in directing the battalion's tactical and technical operation.

In the Spring of 1944, the final re-organization of the battalion, of which Captain Rueskheim, the former Chief of the Meldekopf, was now commander, was consumated. The battalion still remained an integral part of the SIS Regiment, West, but, with respect to its operations and planning, became independent by special order of the Reichsmarschall. The new, flexible organisation, permitted the Meldekopf not only to track the enemy formations when flying over Germany proper, but even to diagnos their intentions while still in their base and assembly areas.

With the creation of the ZAF, the operational sphere of Meldekopf 1 was separated from that of Meldekopf 3 in Berlin by an imaginary line that ran from Hamburg, south to Munich, thus dividing the Reich in half. Until they reached this line, intruding formations were followed by Meldekopf 1; thereafter their tracking was turned over to Meldekopf 3. When the enemy modified his tactics by raiding from several directions simultaneously, or the bomber stream branched out in delta-like fashion to attack several targets, the ZAF would divide the coverage of the enemy formations between three Meldekoepfe; the two mentioned, and Meldekopf Vienna.

In this last year of the war, the 1st Battalion, which later became the independent SIS Battalion 357, was augmented by a radar intercept company, a VHF R/T company, as well as an HF baseline, which completely covered the western area of the Reich. This enabled the Meldekopf to produce a thorough interpretation of the air situation, with special consideration to traffic emanating from the base and assembly areas in Great Britain.

Each company of the battalion was assigned a concrete mission:

1st Company: Meldekopf and final (strategic) evaluation

2nd Company: RAF training units

3rd Company: Bomber divisions of the Eighth USAAF

4th Company: RAF Bomber Command (See Figure No. 1)

The traffic analysis sections of the individual companies were dissolved, and their personnel transferred to the evaluation company. In their place, tactical evaluation sections were created within each intercept company. A primary function of these tactical evaluation sections, was to maintain the closest contact with the experienced W/T operators, thereby reporting immediately to the Meldekopf any possibilities for early warning which might arise from enemy operational and weather traffic. The companies were further encouraged to develope independently new methods of early warning, within their operational sphere. This new procedure relieved the Meldekopf of a great deal of the detailed work in providing early warning. The duty officer in the Meldekopf was too busy to delve into the intricacies of the evaluation of radio characteristics. He had to content himself with collecting the previously-evaluated messages, and comparing their relative importance. Finally he had to see that the messages were passed on to the appropriate units of the fighter defense. Such a procedure could only attain success, if, on the one hand, the companies were continually informed of the intentions of the Meldekopf, and, on the other, if the duty officers of the Meldekopf had complete confidence in the evaluation work of the companies.

The three D/F networks, which in time finally extended throughout all of Germany, received their operational instructions from the D/F plotters at the

Monitoring Operations of 1st Bn. Regt. West

Against Allied Heavy Bomber Units based in the UK

(During first half of 1944)

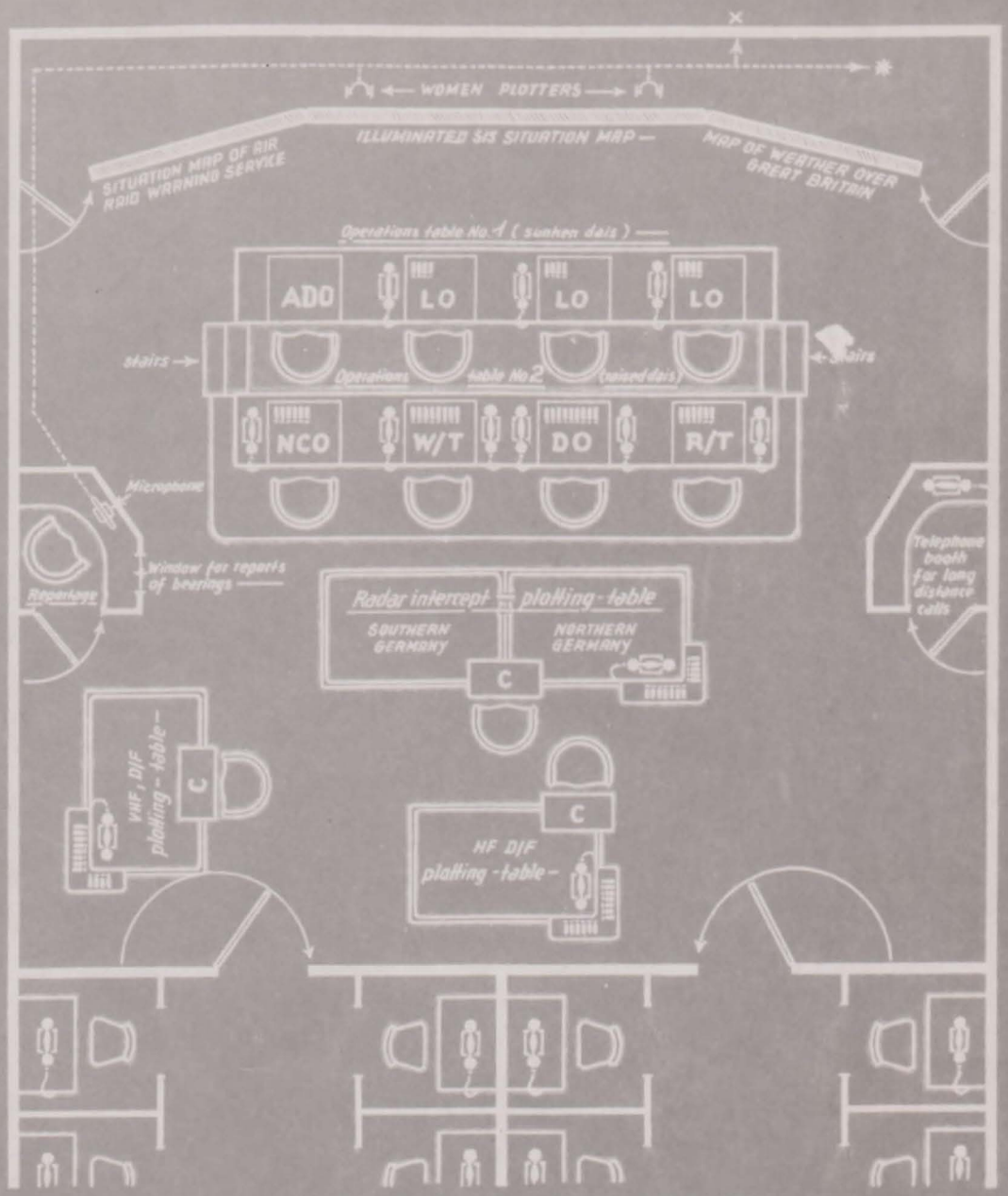
Legend

- Meldekopf 1
- Evaluation co.
- W/T intercept co.
- VHF and HF intercept platoon
- VHF D/F
- Radar intercept
- HF D/F

Figure No 1

Operations Room of Meldekopf 1— Heiligenstadt

November 1944 – March 1945



Legend

SYMBOLS:

- Switchboard
- Telephone
- C — Female Clerk
- * —— SIS broadcast, W/T
- × —— SIS broadcast, telephone

ABBREVIATIONS:

ADO	Ass't duty officer
NCO	NCO in charge of wall maps
W/T	W/T specialist
R/T	R/T specialist
DO	Duty officer
LO	Liaison officers for various Hqs

Figure No. 2

Meldekopf, who, in turn, were guided by the duty officers.

The Meldekopf itself developed rapidly into a type of war room, and boasted its own telephone exchange and radio station. In its operations room the actual picture of the air situation was worked out. There were three separate D/F plotting tables at which the VHF, radar intercept, and HF plots were evaluated. The D/F evaluators received bearings from the out-stations by telephone and radio. D/F fixes were brought to a girl telephone operator who, by means of a conference hook-up, reported them simultaneously to the Meldekopf's subscribers, and to the women auxilaries behind an illuminated blackboard, on which was presented a situation map. The women transferred the fixes to the blackboard, thus keeping the map up to date. The duty officer was flanked by a W/T and an R/T specialist, as well as a strategic evaluator, who acted as his adviser. The strategic evaluation section prepared a comprehensive report at the end of a raid. Intelligence, other than D/F fixes, was reported by telephone to the fighter defense by the duty officer. The duty officer, during his tour of duty, was fully responsible for all reports dispatched from the Meldekopf. For this reason he had to have complete operational control of all units of the SIS battalion during a raid. In order to maintain a check on the work, an official record was kept of all positions and other air situation data reported by the Meldekopf.

Figure No. 2 presents the lay-out of the operations room of Meldekopf 1 in its final position at Heiligenstadt. It represents the best conception of an efficient SIS war room. Placing the three D/F plotting tables in the same room with the duty officer and his advisers, enabled the duty officer to maintain direct contact with his D/F evaluators. By this arrangement, and by

close co-operation between the three D/F plotting sections, it was possible to provide the fighter defense with a coherent picture of the route of enemy bomber formations. The Meldekopf was able to maintain this service, even during the last weeks of the war, in spite of the fact that a number of its D/F positions had been overrun by the enemy.

The most serious problem for the Meldekopf, especially in the last months of the war, was that of signal communication. The work of the Meldekopf was vitally dependent on its wire and radio communication with other headquarters, and with its own SIS units. For telephone calls to the important out-stations alternate routings were prescribed to provide for those cases where enemy bomb damage had rendered primary routes unserviceable. A stand-by radio link was available for every operationally important telephone trunk channel. The following radio networks were available to the Meldekopf:

Battalion network

VHF D/F control network

Radar intercept control network

HF D/F control network.

In addition to direct land-line communication with the CP's of various fighter units, every tactically important report was sent by radio in the form of a signal intelligence broadcast. Headquarters which could not be reached by wire were given the appropriate cipher system with which to read the SIS broadcast from Meldekopf 1.

Before the ZAF was founded as the central distributor of all tactical SIS reports relating to the defense of the Reich, the Meldekopf served an imposing

list of subseribers (See Figure No. 3). These subscribers reshaped reports from the Meldekopf to conceal the source of the intelligence, in accordance with special security regulations, and passed them on to all flak units and air raid warning message centers, and, when necessary, even to individual flak emplacements and airfield sectors.

In the distraction of the final days, when raid followed raid almost without surcease, and, in consequence, all military personnel in the rear areas as well as at the front, had to remain on almost continuous duty, life came to be regulated more and more by reports of the Meldekopf. No finer tribute could be paid to the reliability of those reports, and the perfection of the techniques that produced them, than to state as fact that never once a report had been released to the effect a night would be free of enemy aerial intrusion, did the personnel of the Meldekopf need to blush for a mistake in its calculation.

Substribers to SIS Broadcast of Meldekopf 1

(before the creation of the ZAF)

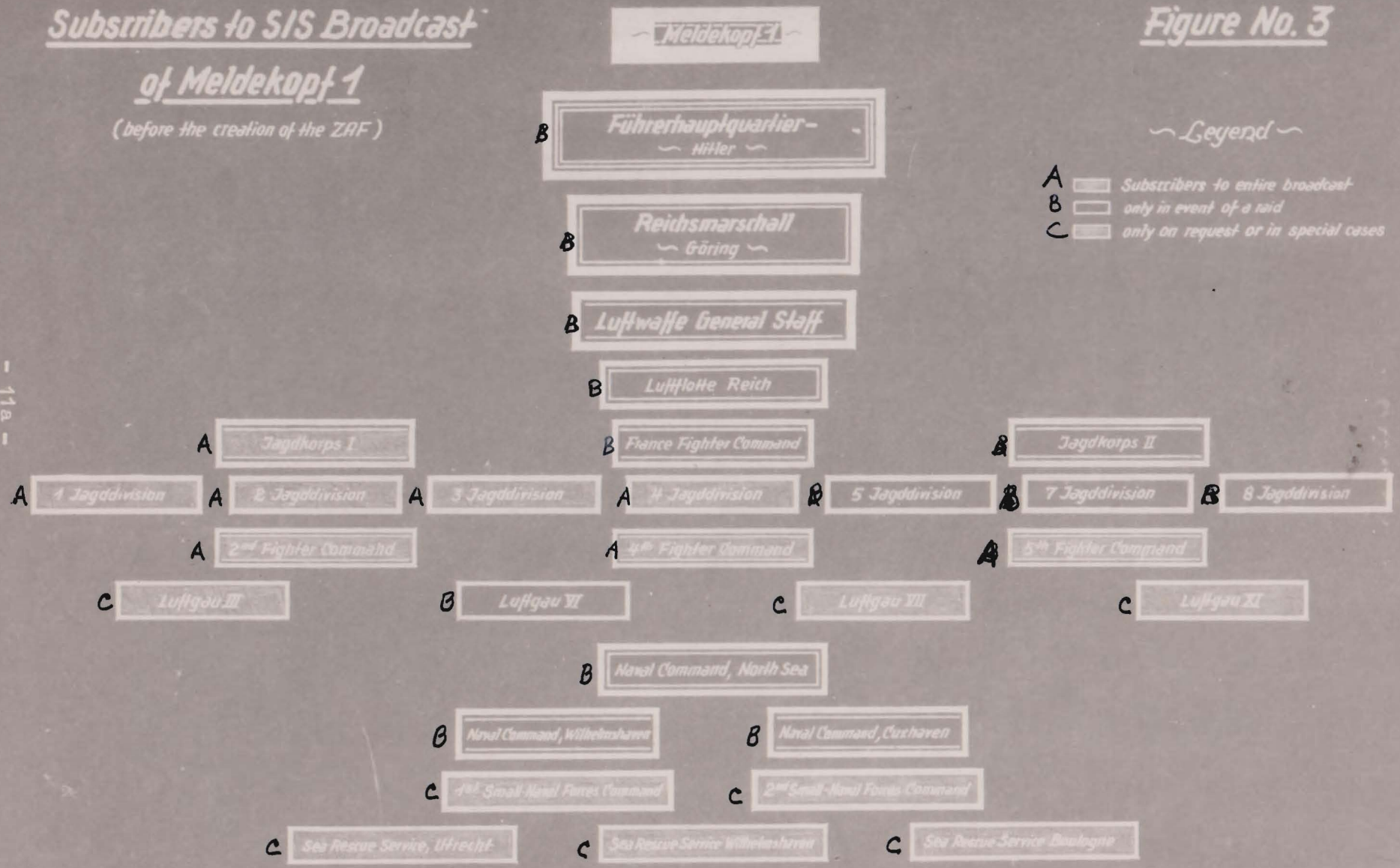


Figure No. 3

Legend

A Substribers to entire broadcast
B only in event of a raid
C only on request or in special cases

EARLY WARNING

By

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The problem of early warning became acute when the RAF began its heavy raids on Germany proper. It became even more urgent when the 8th USAAF joined the RAF Bomber Command in unrestricted aerial warfare against Germany, and the Luftwaffe limited itself for the most part to a defensive role. Reliable and timely early warning was to be one of the most important tasks of the Luftwaffe SIS.

The first attempts to obtain clues for advance warnings from enemy radio traffic hark back to bomber R/T traffic on 6440 kcs. ("Darky" frequency). From tuning traffic between ground stations and aircraft, and from early messages, the strength of RAF night intruder formations had been determined. In those days the number of bombers involved was no more than 80-100. Evaluation of this traffic was made easier by the separation of operational airfields and OTU bases. After 1943 the HF R/T traffic of combat units continually decreased, while that of the OTU's increased. For this reason, monitoring of the RAF Bomber Command R/T traffic yielded no fruitful results.

On the other hand, ever since 1943 the monitoring of American bomber R/T on HF frequencies gave very lucrative indications of impending air activity.

During a later period, advanced warning had been given as early as the evening before daylight attacks of the 8th USAAF, simply on the basis of this R/T traffic. If, after normal daytime R/T traffic had come to an end, tuning and readability traffic, and W/T activity were renewed, then these observations were sent out by Meldekopf 1 as an early warning.

This type of advanced warning was facilitated by the fact that, at the end of 1943, the 8th USAAF introduced the use of special airfield frequencies in addition to the regular HF frequency of 6440 kcs. It remained, therefore, to determine the call-signs of the ground stations; the intercept operator needed only to have his receiver properly calibrated in order to identify the airfield in question. In the final period the efforts of the combat wings to give instructions to their formations on HF instead of VHF were realized. Perhaps it was due to reception conditions over England, which changed daily; at any rate, it was suprising how open and voluminous the HF traffic over England was, both during the assembly, and the approach flights to the target.

In the beginning of 1943, the first basic attempts were made to find possibilities for early warning in the air-to-ground W/T traffic. At that time a scrutiny of the radio traffic from the "Regional Control Stations" was begun. England was divided into fixed saftey areas; the radio traffic for each zone was handled by a specified radio station, which was often a bomber airfield radio station as well. During the early afternoon hours a large number of unidentified call-signs would be heard in tuning traffic with those Regional Control Stations serving southern England; this would be followed, at night, by a rather large-scale raid on France, or over France into Germany. However, the experiment was a failure in the sense that the strength of an expected night attack could not be predicted from the number of call-signs heard communicating with these Regional Control Stations.

On the other hand, around this time a special phenomenon was noted by good SIS operators engaged in monitoring the enemy airfield D/F sections. Approximately one hour before the first enemy aircraft was plotted over the sea, certain, short whistling tones were heard, in varying intensity. In the case of a raid by approximately 250 bombers, 12-25 of these whistling tones were heard in short, chronological sequence. Specialists explained this phenomenon as the tuning of aircraft transmitters to zero beat. Thanks to these whistling signals, remarkably good advance warnings could be given from April to June, 1943. According to the D/F section, not only the strength, but also the probable area of attack could be predicted.

In addition short-interval early warning was guarenteed at all times through the interception of British H2S. The period in which the Meldekopf was able most accurately to predict raids was the summer and fall of 1943. When the whistling signals no longer occurred frequently enough to be reliable, monitoring of the radio station at Graveley airfield (8 Pathfinder Group) furnished accurate clues. Graveley, one of the newer satellites of Wyton, was seldom heard by day. The radio station at every other bomber airfield sent its call-sign and the time, every 15 minutes for check purposes. Graveley was the only bomber airfield which sent its check signals only until noon, and then went off the air. If a mission were to be flown in the evening, the radio station would renew its checking transmissions in the late afternoon, or at least long before take-off time.

Research conducted by the final evaluation section of Meldekopf 1 indicated that aircraft from Graveley took part in every enemy raid. Therefore, without incurring any risk, or considering the daily signal intelligence

picture, an advance warning could be given on the basis of the resumption of quarter-hourly procedure at Graveley.

In the summer, new possibilities for early warning were explored, since it was known that the enemy was fond of changing his tactics suddenly. In addition to the continuous search for traffic on medium frequency, an effort was made to obtain a signal intelligence picture of all active squadrons, and to arrange the information according to the following pattern, in order to decide whether night attacks were impending or not:

Airfield	Number of aircraft heard	Number of tuning messages intercepted	Landings and peculiar messages

However, the evaluation of these tables was performed too superficially, and as a result no valuable intelligence was really gleaned from them. For this reason a small, select group of specialists was continually on the lookout for new methods of obtaining early warning.

First of all they proposed examining all the daytime radio traffic of the Pathfinder Group (8 Group). The reason for this was that no large-scale missions over Germany or the western occupied areas were flown without Pathfinders, which represented the brain of such an attack. If the radio traffic of this group yielded hints of an operation, then the method developed could be applied in the same way to the main body of the bombers. It so happened that the entire signal intelligence picture of 8 Group over the period of a month could be reconstructed relatively quickly, and hence the real work of evaluation could be started. The research proceded on the theory that daytime radio traffic on non-operational days must be noticeably different in certain characteristics from traffic on days when no attacks followed. Thus, the radio

traffic of all airfields of 8 Group was separated into different periods of the day, and subjected to a detailed examination. From this the following was determined:

On non-operational days, daytime radio traffic between aircraft and their airfields had no special peak. During the forenoon there was mostly identification and tuning traffic, with no special indication of haste on the part of the ground station. During the noon hours there was almost a complete lull in activity; the British partook generously of their noonday ease. In the afternoon tuning traffic began again, and now and then D/F traffic was heard. In scrutinising the traffic of the airfield D/F sections, special attention was paid to those aircraft performing cross-country flights. Moreover, the W/T intercept companies which were entrusted with the monitoring of Bomber Command reported those Pathfinder aircraft call-signs which appeared in the traffic of other groups. After the traffic of the Conversion Unit at Wyton, which was quite voluminous, had been eliminated, there remained a good picture of the activity of the Pathfinders. The signal intelligence picture of this unit, on a day immediately preceding a night raid, looked approximately as follows:

In the morning there was lively tuning and recognition traffic, the peak being reached between 1000 and 1130 hours. The small amount of D/F traffic, appearing during the noonday hours was ascribed to ferry flights to and from the repair-shops. At noon came the "briefing-pause", and therefore very few Pathfinder aircraft were heard. To properly evaluate the noonday radio silence, an exact knowledge of weather conditions over the take-off areas was important. Therefore a weather map was made, and no source of information was ignored in

building up the truest possible picture of the weather over the 8 Bomber Group bases (radio traffic between the ground stations of 8 Group and aircraft from other airfields; weather reports from training units flying over England, from deciphered bomber code messages, and from naval radio stations). The recall of British training units around noontime would be an unquestionable indication of an expected deterioration in the weather. Very frequently the signal intelligence picture would definitely indicate a raid, and then the sudden appearance of a bad-weather front would cause the mission to be cancelled.

In December practical utilization of the intelligence gained from the study of Pathfinder traffic was begun. Every evening an air situation report, such as the following was broadcast:

Appreciation of the Air Situation, 1730 hours

In the forenoon, there was tuning activity on the part of all groups (both bomber and Pathfinder), but with no noticeable peak period. From noon on, cross-country flights by units of the Halifax Groups were observed, over the middle and western sectors of England, and over the Irish Sea. In some instances flights of Pathfinder aircraft over the northern bases (6 Bomber Group) were observed. Pathfinder tuning traffic also came to a stop at noon. Training operations by the OTU's were carried out all day long, in all areas. Tuning traffic on medium frequency is normal, and shows no point of concentration.

Conclusion: No large-scale raid is intended.

This research was the impetus for a reorganization of the W/T intercept companies. In the same way as with the Pathfinders, a study was begun of the radio characteristics of the other groups. Daytime radio traffic was visually

presented on large, glass blackboards by the use of appropriate symbols, and was posted hourly. On these blackboards were shown:

Air activity at a given airfield;

Tuning traffic from this airfield;

Volume of radio traffic with aircraft from other airfields.

When later the RAF also flew daylight missions, there was also included information as to which units had completed their missions.

A digest of this information, together with a record of the missions which followed, was kept in a diary, in order that every radio characteristic which seemed important to certain intercept problems could be referred to. This saved loss of time in thumbing through log sheets. To the blackboard picture was added a new board on which was noted those radio characteristics which could only be observed by the intercept operator (change of transmitter, increasing of signal strength, tuning to zero beat, change of radio operators, continuous notes, sending of V's, etc.). These characteristics were also tabulated and compared with those on the other blackboards.

This tiresome work was not done in vain. There emerged the facts that the Pathfinders of the minatory 5 Group tuned to the zero beat of their frequency long before their radio traffic over the target was heard, and that the same whistling tones could be heard from jamming aircraft of 100 Group, shortly after they took off from Foulsham. Also that the radio operators of 5 Bomber Group were changed frequently on non-operational days, while during a mission the same operator remained on the key.

The ever more frequent daylight raids of the RAF were predicted without difficulty. If, for example, 3 Bomber Group was to fly at noon, there was no tuning traffic during the morning. In short, an alerted group maintained radio silence.

Tuning traffic proabably originated with the ground personnel rather than with the airborne radio operators. Perhaps it was also sent during repair-shop flights over an airfield, but this was not absolutely necessary. Perhaps it represented a certain playfulness on the part of radio repair sergeants who also wished to send a little radio traffic. The non-appearance of this tuning traffic became one of the most important clues for the Luftwaffe SIS in predicting a coming attack.

The following depicts the sequence of events in a night raid, showing how, in the latter years of the war, it could be identified by SIS, and advance warning given:

1700 hours: Lancaster units have been alerted for operations during the first half of the night. Whether Halifax squadrons are to be used also - is not yet known. 5 Group Commands special attention.

1800 hours: 100 Group has already taken off.

1825 hours: The first aircraft of 100 Group has been plotted; it reported damage. By means of many bearings its course is learned; it is flying over Dunkirk on a southeast course toward the Charleville area.

1825 hours: A bomber code message in the new setting, which is only valid for one night, is sent by an airfield of 1 Group; this meansthat the

aircraft of 1 Group are already airborne, but their course is still unknown.

1900 hours: The monitoring of Allied aircraft reporting networks, carried out by Meldekopf 2, indicates a large enemy (British) formation in the Somme-estuary area. At this point an advance warning is broadcast to all parties concerned.

1910 hours: An OTU aircraft attempts to home on an arifield of 5 Group and is turned away by the airfield D/F section (certain "Q"-signals). Therefore, the participation of 5 Group must be reckoned with. The HF and VHF D/F networks are alerted to monitor the frequencies of 5 Group.

1920 hours: An aircraft with a known operational call-sign requests a check bearing from the arifield D/F section of the Halifax units. Therefore, the Halifax units also warrant attention.

1935 hours: The Allied Air Raid-Reporting Service repofts a second wave of aircraft. It is probable that on this night all groups are taking part in the raid.

1945 hours: The first line bearing on a "Magic Box" (H2S) is reported. Since radar intercept is now bringing results, the course of the enemy units can now be checked, depending on the number of bearings. Once the course is accurately determined, night-fighters can be brought into play.

1950 hours: A "Magic Box" is plotted over the Deutsche Bucht. Since no jamming aircraft fly into this area, it can only be a Mosquito flight or a mine-laying aircraft.

2000 hours: The control stations of 4 and 6 Groups transmit "winds aloft" messages on a CQ call-up. From this it is known that the first wave consists of Halifax squadrons of 4 and 6 Groups, led by Pathfinders of 8 Group. The bomb-release signal can be expected within 20-30 minutes of the "winds aloft" messages, and therefore the formation will probably not intrude deep into Germany proper. Attention must now be given to the Boomerang-controlled Mosquitos of 100 Group.

2010 hours: The first wave is plotted by radar intercept; course is toward the Rhine-Westphalia industrial district. The second wave is plotted for the first time in the Rheims area.

2020 hours: A "winds aloft" message is heard on the 1 Group frequency; this time it is sent by the aircraft to the control station. 1 Group, therefore has penetrated deeper than the Halifax formation. This information allows identification to be given to previous "Magic Box" plots on this unit.

Note: 100 Group usually flies in a wide formation, veiling the movements of other groups, and making it difficult to determine the course of individual units.

2025 hours: The identification of all jamming aircraft which have been plotted is successfully completed, and their relative positions with respect to the individual units clarified; points of concentration of the jamming aircraft can now be reported.

2030 hours: Zero beat tuning on the headquarters frequency of 5 Group is heard. Accordingly, fresh warning is given of activity on the part of this dangerous group, whose course is still unknown.

2035 hours: The Boomerang-controlled target-markers for the Halifax formation are plotted. Special local warning is given to the area in which the attack is expected.

2037 hours: Interception of Pathfinder R/T traffic (VHF) on the "C" frequency of 8 Group; the aircraft are identified as Boomerang-controlled Mosquitos. A report to the ZAF states: Halifax formation will release bombs in a few minutes.

2039 hours: "Winds aloft" messages are now sent by Pathfinders of 8 Group also. The contents are identical with those sent by 1 Group; thus, 8 Group are the Pathfinders for 1 Group. To what extent 8 Group is a part of the main bomber stream is, for the present, still not clear.

The report on the strength of the intruding formations states:

aa) Halifax formation approximately 380-450 aircraft (Lancasters of 6 Group have probably not accompanied them), led by Mosquitos.

bb) Lancaster formation heading toward Southwestern Germany with about 300 aircraft (to what extent 8 Group, except for its Pathfinders, is represented in the formation remains uncertain).

cc) 5 Group is active in undetermined strength; area of operations for the present unknown.

dd) Mosquito formation of 60-80 aircraft toward Berlin (target is only presumed, since Mosquitos regularly attack Berlin at this time of night).

2040 hours: 3 Group will probably not operate, since training activity is taking place on their airfields.

2050 hours: A small amount of training flight activity begins on two airfields of 5 Group. It is therefore presumed that specialized squadrons are carrying out a special mission.

2055 hours: OTU aircraft of 93 Group are recalled to their bases. Consequently there is probably a bad-weather front moving toward their airfields. The W/T companies are instructed to pay special attention to rerouting orders from the control stations of this group.

2115 hours: The control station of 8 Group sends a CQ message giving a report of winds aloft over the target. This indicates that the Lancaster formation will drop its bombs within the next half hour. The target area can then be determined by computing the distance that the Lancasters fly in the next half hour (their course being already known), and advance warning given.

2135 hours: The control station of 5 Group resumes its zero beat tuning. It might be for D/F purposes and 5 Group might be in the vicinity of the target.

2140 hours: Report from Jag division 7 target-markers over city X.

2140 hours: Aircraft of 1 Group send "winds aloft" messages for a section already flown through (for return flight purposes). The result is an SIS message stating Lancaster formation has reached the target; no further penetration to the east.

2145 hours: The control station of 3 Group sends an order to a squadron from Waterbeach, diverting it to another airfield. Either the bad weather front has already reached the 3 Group bases, or Waterbeach must be kept open for aircraft returning from operations.

2145 hours: W/T Pathfinder traffic from the control station of 5 Group is intercepted. Accordingly, the special squadrons of the Group are in an area directly in front of the target. At the Meldekopf great excitement prevails; where are the aircraft? The possibility that they are over Germany is slight, because no flights were reported which have not been identified by SIS. After much telephoning to various tactical headquarters it is finally learned that a rather small bomber formation is approaching Bergen. Immediately an identification is made: These are the special squadrons of 5 Group. The first plot on a "master of ceremonies" of 5 Group confirms this assumption; the special squadron from Coningsby is flying over southern Norway.

2150 hours: An aircraft of 8 Bomber Group sends the first report of results; it is plotted on its return flight from the area of city X in southwestern Germany. The return flight of the main bomber stream has therefore begun.

2150 hours: The Halifax airfields begin sending reports of weather over base, landing conditions seem to be favorable in their areas.

2153 hours: The first report of results is intercepted on the Coningsby airfield frequency; it is immediately repeated on the Group frequency.

Note: The Pathfinder traffic of this group was especially interesting. The "masters of ceremonies" for the most part did not avail themselves of the three-letter code, and used plain text. 5 Bomber Group, which in other matters was generally acknowledged to be a well-trained unit, often employed new types of radio procedure carelessly. The introduction

of "winds aloft" messages in December 1943 can be cited as an example. Instead of using the well-compiled code provided, messages were sent practically unencoded, or at least those parts were left unencoded which were most important to SIS. After several aircraft had measured the velocity of winds aloft on a certain section of the route, and passed this information on to their airfield, the headquarters then computed the probable wind velocity for that section of the route still to be flown, and transmitted this intelligence to its aircraft in flight. Since the code-letters used for this purpose were easily broken, the headquarters actually revealed the intended depth of penetration of its bombers, and gave SIS an opportunity to determine the target in advance, to inform the Command between which degrees of longitude the bombers would change course, when they would drop their bombs, how many main waves there would be, etc. It was especially easy in the case of 6 Group to determine its division into various waves, because the Group headquarters sent a "winds aloft" message to each separate wave. The Pathfinders of 5 Group also used plain language when W/T traffic was first introduced; only later did they go over to the use of a special three-letter code which changed daily.

2155 hours:: A bomber code message from the headquarters of 1 Group is deciphered and is found to contain re-routing instructions.

Note: Several times it happened that the bombers were called back

by their control stations, shortly after passing over the English coast; in such a case certain air-craft receipted for the message. It was not determined to what extent the British had to authenticate unusual messages. Under certain circumstances the Luftwaffe SIS might have been able to send decoy orders to the bomber groups. However, such an attempt was forbidden by the Chi-Stelle, because it was afraid, by such a practice, of causing all Bomber Command W/T traffic to dry up.

Whatever further traffic was intercepted from the bomber formations on their outward flight could no longer be used tactically. Individual QUM's and reports of weather over bases pointed to landings; as a rule, flight-control traffic from the airfield D/F sections was of a minimum. Emergency calls from damaged aircraft served for purpose of statistics. Only if German long-range night fighters pursued the bombers on their return flight, did these messages have any tactical value.

By far the greater part of the effort was consciously directed to producing possibilities for early warning from the traffic of the RAF Bomber Command. All the possibilities uncovered were similarly applied to the monitoring of the 8th USAAF. However, in this case no such exertion, as following the British bombers required, was needed. The Americans were much more massive and primitive in their tactics, and can scarcely be said to have practiced restraint in their voluminous W/T and R/T traffic.

Long-interval advance warnings of raids by American bomber formations could usually be given as early as 2300 hours on the night before a daylight attack.

The first indication of the raid proper was the interception of traffic from weather reconnaissance aircraft. The weather ships sent their reports to their home bases, as well as to certain prescribed headquarters. In this way they could be D/F'ed, and then it could be stated quite definitely into which areas the 8th USAAF would fly. Zero beat tuning was heard on the bomber division frequencies in the early morning hours preceding a raid. Next, the take-off of the individual units was monitored. During the assembly, which continued for as long as two hours, depending on the size of the raid, an exact picture of the composition and strength of the formations was obtained from VHF R/T traffic. A certain code-word then indicated that the bomber division was setting its course. Research work, as in the case of the RAF, was really not necessary; the Americans spoke of whatever they were doing quite openly.

The following is a description of the course of a typical American heavy bomber raid, and, as in the case of the example of an RAF raid, represents tactics during the latter years of the war:

2300 hours: Since R/T and W/T tuning traffic is being sent from 8th USAAF airfields, a raid must be intended for the next day.

0330 hours: A weather reconnaissance aircraft from Molesworth sends a message. A fix cannot be obtained from this one message.

0430 hours: Now weather ships of the 2nd and 3rd Bomber Divisions send messages; they are plotted over the assembly area in England.

0515 hours: A light jamming-screen appears over the southern portion of the North Sea, and off the eastern coast of England. At the same time the first take-off messages are intercepted on W/T frequencies.

The first operational call-signs are sent on the airfield W/T frequencies, an indication that no training flight, but rather a raid, is taking place.

0520 hours: A second weather reconnaissance aircraft of the 3rd Bomber division is plotted while sending a message from a position over France. Inference: the 3rd Bomber Division, at least in part, will assemble over the continent (their assembly areas are learned from D/F-ing the radio beacons, as well as from captured documents).

0600 hours: Although it is known from the preceding W/T traffic, as well as from HF R/T messages, that the assembly is taking place, it is curious that still no VHF traffic is heard.

0620 hours: Individual aircraft are heard in tuning traffic with their ground stations (these tuning messages are especially frequent in the case of the 2nd and 3rd Bomber Divisions). Bearings indicate that they are heading toward the continent. A few formation leaders of the 2nd Bomber Division are now heard on VHF R/T, still over the assembly area in England, approximately over Cromer. With the exception of reconnaissance aircraft, there is still no sign of the 1st Bomber Division (the 1st Bomber Division, especially in the last period of the war, exercised exemplary restraint in its use of radio). A picture of the situation is now passed on the the people concerned: the 2nd and 3rd Bomber Divisions are assembling over the continent in considerable strength; of the 1st Bomber Division, which will also probably take part in this operation, nothing can yet be said as to when and where it will assemble.

0700 hours: A jamming screen is reported over the Belgium-Holland border area. It is not a reliable indication of a four-engined raid; it can just as well be a screen for a Marauder attack.

At the same time the first VHF traffic from the assembly area over France is intercepted. Call-signs of formation leaders and squadron colors are learned. The ZAF is given a preliminary picture of the expected strength while the division is still assembling. During the assembly, answers to questions concerning the stage of assembly are being given to interested headquarters; at the same time, the signal intelligence picture is being completed by calls to the SIS out-stations.

0730 hours: All the combat wings have now been D/F'ed; while, up to now, orders have been given principally on the wing frequencies, now the messages are sent on the division frequency. Therefore the assembly is nearing its final stage. Meanwhile the 1st Bomber Division has been heard in its assembly area over France, so that a comprehensive picture of the air situation can now be given; only the stage of assembly in the case of the 1st Bomber Division is still not known.

0740 hours: The first R/T traffic on the frequency of the fighter escort is heard; the approach flight must begin in the next few minutes.

0745 hours: The first message during the flight to the target is intercepted. It reads as follows: on time minus eight, on course, visibility three, too (time of origin) 0740.

At this point the defense is alerted. By D/F-ing these obligatory messages the exact position of the formation is learned. In the

case of the 3rd Bomber Division, each combat wing commander has to send one of these messages; thus the Luftwaffe SIS can determine the strength of this division. Generally, its strength can be reported quite accurately to German tactical headquarters during the flight from the assembly area.

Early in 1944, some unit commanders of the 1st and 3rd Bomber Divisions even availed themselves of the MF D/F network, in order to orient themselves while still over the sea on their outward flight. It was quite obvious that practically nothing was being done to conceal the intentions of an attack.

Henceforth, continuous tracking is guaranteed by D/F-ing the abundant R/T and W/T traffic. A third prolific source is bearings on the "Mickey" equipment.

0800 hours: The first weather ships, reconnoitering the outward flight course, are heard on R/T, and appropriate D/F stations are detailed to monitor them continuously. By following them, the route of the bombers can be accurately predicted.

There were days on which these weather reconnaissance aircraft could be plotted en route to the target, two hours before the bomber formations left the assembly area. In the last period there was an increase in the number of cases where their messages were not sent through relaying aircraft on VHF, but on W/T.

Special mention should be made of those weather ships of the 15th USAAF which revealed targets to the Luftwaffe SIS many hours before the raids actually began.

0900 hours: The first German fighters are mentioned in the bomber R/T traffic. Large-scale serial battles were not frequently revealed in the signal intelligence picture; only in the case of several heavy raids on Berlin was there a plethora of reports of attacks, of comments on the aggresiveness of German fighters, of curses from the unit commanders, and reprimands to their disorganized formations. The signal intelligence picture was not a very fruitful source of intelligence on Allied losses.

0930 hours: The reconnaissance aircraft report weather over the target (as a rule for several targets), and advise the bomber formation as to whether the bombing should be done visually, or by instrument.

0945 hours: The switching on of "Mickey" equipment indicates that the bombers are pivoting toward the target.

0950 hours: The formation leader of the first wave gives the order: "bomb bays open" (clear text or code-word).

0953 hours: Wing after wing gives its bomb-release signal. Code-words occasionally used for this order varied according to the division.

1000 hours: The first reports of results are intercepted.

1100 hours: The first reports of weather over base are heard.

Note : Deciphering of bomber code messages presented no difficulties. They could be read with a depth of only three or four messages. The deciphering was facilitated by the fact that the most of the enciphered messages had been previously heard in plain language on R/T. Therefore it was only a problem of organization to collect this abundant material, and to concentrate it in the hands

of the duty officer without delay. How this was performed is described in the article on the Meldekopf.

THE FIGHTER WARNING SERVICE

By

Technical Sergeant Karl Jering
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A. Introduction

The Luftwaffe Fighter Warning Service was an agency developed by the Signal Intelligence Service to warn German bomber and reconnaissance crews of the presence and intentions of Allied fighters in their area. In the early days of the war, when the Luftwaffe still retained its supremacy in the air, this service proved useful, though not vital. Later, when Allied fighters roamed the skies at will, these warnings very often represented the difference between life and death to German reconnaissance pilots.

The history of the Fighter Warning Service divides itself into two periods. The first stage was that during which airborne R/T operators were the instrument of warning. These SIS linguists accompanied bomber and reconnaissance crews on operational flights, and warned their pilots of the approach of Allied aircraft. However, as the strength of the Allied air forces increased, and in consequence Luftwaffe losses became heavier, the SIS found that it could ill afford any further reduction in personnel, so difficult to acquire and train. Thus, the use of airborne R/T operators was discontinued, and the second stage in the history of the Fighter Warning Service began. This consisted of warning

German aircraft, from the ground, of the approach of Allied fighters. The warnings were transmitted to the German aircraft on their tactical frequencies. Originally, the source of information was R/T traffic from Allied fighters. Later this was augmented by messages intercepted on Allied radar reporting networks.

B. The First Stage (1940-1942)

1. The Airborne R/T Operator in the West (1940-1941)

The use of airborne R/T operators dates back to almost the very beginning of the war. Their employment was undertaken more with the thought of allowing SIS to share in the glory accruing to combat crews, rather than for reasons of necessity. The idea was first conceived by Captain Hartwig, the most outstanding personality in the Luftwaffe SIS during the early days of the war. His death, while flying a mission over England as An R/T interceptor, proved to be an irreplaceable loss to SIS, at a time when his unique talents were most needed.

Especially in the first years, the airborne R/T operator provided SIS with its most spectacular successes. These intercept operators were detached from SIS R/T platoons to bomber and reconnaissance Gruppen. Here they lived with the operational crews and shared their higher standard of living. When on missions, they usually replaced the aerial gunners, and therefore had to be able to man the guns in the event of enemy fighter attack. Although, especially in the first years of the war, the qualification requirements and training of flying personnel were very rigid, and crews were only allowed to fly combat missions after several years' training, R/T operators, on the

contrary, were integrated into aircrews without any previous flying experience. Often it occurred that such personnel was not even given a physical examination before flying, if it were certain an R/T operator knew how to operate the radio receiver used, and his services were required.

The airborne interceptor acquainted himself with the type of R/T traffic to be expected from Allied fighters, and memorized a list of frequencies to be monitored during the mission. Immediately after the take-off he began searching the appropriate HF frequency band. Since the frequencies of RAF fighter squadrons were known, the enemy defense could scareely escape detection by the R/T operator. Thus, as soon as enemy fighter R/T traffic began, it was intercepted by the airborne operator. He would immediately inform the pilot of all messages which seemed important to him, so that the latter could take the necessary evasive action in ample time. Nevertheless, if an enemy fighter approached within range of fire, the R/T operator would move from his seat at the receiver to the gunner's position, where the weapon was maintained in a state of readiness for defense against fighter attack.

The assignment of R/T operators to combat units contained the risk that they would lose contact with their parent units. To prevent this, they were frequently recalled to their SIS platoons, and others sent to replace them. Since the RAF Fighter Command, at this time, was still using HF, and therefore its fighter R/T could be easily monitored from the continent, the SIS platoon had a through and detailed knowledge of the strength, bases, frequencies and combat efficiency of the individual fighter squadrons. Therefore, reports covering newly-acquired intelligence on the RAF Fighter Command were sent weekly to the airborne intercept operators with the combat units, by the

evaluation sections of the SIS company, in order to keep them informed of the current enemy situation. They, in turn, were obliged, upon the completion of each mission, to furnish to the evaluation section a report of their experiences. This report had to contain an accurate chart of the route taken, showing position times, position and time of the first interception of enemy fighter R/T traffic, and of the first contact with the enemy,etc. The charts and their legends were compared by the evaluation section with interceptions of enemy traffic made from the ground at the same time. In addition to this, every six months the airborne intercept operator had to prepare a comprehensive report indicating his experiences over this period, the traffic intercepted by him, special observations made during missions, as well as his personal suggestions and comments. Thus the evaluation section received valuable data, and, at the same time, the R/T operator remained in constant touch with the general work of the SIS.

The employment of these operators was first begun in Husum by the SIS company serving Fliegerkorps X; later the SIS company accompanied the Fliegerkorps to Norway, and the work was continued from Stavanger. For their use, radio intercept receivers "O" or "D" were installed in HE 111's and JU 88's. The airborne operators were used, on the one hand, on bombing attacks against industrial targets in Scotland (for example, Britain's largest aluminum plant), and, on the other, for long range reconnaissance missions over the North Channel, between Ireland and England. As early as the summer of 1940, the airborne intercept operator flying on missions to this area, so vital to England, and consequently so heavily defended, was considered in the nature of life insurance by the reconnaissance crews. The crews were so dependent upon the collaboration of the R/T operators that they did not like to fly combat mis-

sions without them. The use of airborne R/T operators was kept extremely secret and they were strictly forbidden to take any SIS records into the aircraft with them. Finally, their use was practically ended in the West by the switching over on the part of the RAF Fighter Command, between November 1940 and April 1941, from HF to VHF; and the transfer of Fliegerkorps X from Norway to the Mediterranean theatre.

2. The Airborne R/T Operator in the Mediterranean (1941-1942)

In the Mediterranean area the use of airborne R/T interceptors continued, and was further developed, principally because in this theatre the change-over of enemy fighters from HF to VHF was delayed for a full year. The brunt of these missions continued to be borns, in the main, by the 9th Company LNR 40, the SIS company of Fliegerkorps X. The SIS platoon of this company in Africa supplied airborne interceptors for missions to Alexandria, which were dreaded by German reconnaissance crews; as well as for the special Luftwaffe missions to the Haifa oil installations or the Sues canal. The demands made upon the few available R/T operators in Africa were prodigious. While the regular reconnaissance crews were called upon, on the average, to undertake operational missions only once every three days, the R/T operators, when necessary, had to fly as many as three combat missions in a single day. In proportion to their small number, their losses were inordinately high. So, after the withdrawal of Rommel's "Africa Korps" from the El Alamein line, the use of airborne R/T intercept operators had to be drastically curtailed. Later, the following reasons were responsible for its complete abandonment:

a) The change-over from HF to VHF by enemy fighters in the Mediterranean also. On this account, the problem of developing a suitable VHF airborne intercept receiver again became acute. The German "Victor" receiver proved inadequate. Attempts to install the "Sadir" receiver failed because of its susceptibility to interference, as well as because of power supply problems. Throughout the whole war, German industry was unable to develop an airborne VHF receiver satisfactory to theSIS.

b) The inability of airborne intercept operators to D/F enemy R/T traffic.

c) The development by the SIS of other methods of fighter warning.

After 1942, only occasional use was found for airborne interceptors. For example, they were employed to determine the organization and order of battle of the RAF Levant-bases fighters at a time when they could no longer be heard by German out-stations in the Aegean, owing to the low signal strength of their transmissions. Also, intelligence concerning fighter control stations in the South of France, following the invasion of this area by the Allies, could not be obtained by interception from Italy, owing to the interposing mountain ranges, and in consequence necessitated the use of airborne interception.

C. The Second Stage, 1943-1945

From 1943 on, the protection of German reconnaissance crews was accomplished, in the main, from the ground, thanks to two sources of intelligence, which had meanwhile been developed by the SIS. One consisted of monitoring enemy fighter R/T traffic, which monitoring was so integrated that results were systematically evaluated and immediately transmitted to the recon-

naissance aircraft. The other comprised monitoring the enemy radar reporting networks, the resulting picture of the air situation being telephoned to the signal officer of the reconnaissance Gruppe.

1. Fighter Warning From Enemy R/T Traffic

The methods used in warning German reconnaissance aircraft varied in accordance with the requirements of the individual theatre of war, as well as with the modus operandi of the R/T units concerned. In the following paragraphs the operations of the Fighter Warning Service, as they were conducted by the 9th Company, LNR 40 in Crete for the eastern Mediterranean, are described.

The cipher key for fighter warning messages was changed daily; it was transmitted by radio from the company to its R/T out-stations at an appointed hour. The ground station of the reconnaissance Gruppe was also included in the fighter warning network. The transmission of the cipher key followed independently of whether a reconnaissance mission was planned or not, in order to give the Allied SIS, whose existence was taken for granted, no clues, upon the basis of which it could eventually draw conclusions. If a mission were intended, the company was notified by headquarters of the reconnaissance Gruppe in ample time. The company, in turn, passed this information on to its out-stations by radio in a very abbreviated and enciphered form. Even those out-stations which were not concerned with a mission, owing to their geographic location, were given this information. In this way, the enemy was unable to predetermine the general area to be reconnoitered.

The R/T out-stations of the company were in a position to warn the

aircraft on W/T, throughout the entire mission. If enemy fighter R/T traffic were heard in the area of the reconnaissance aircraft, it was immediately evaluated by the out-station and broadcast in cipher to the aircraft on a CQ call on its tactical frequency. The code table, which was changed daily, contained symbols for the most frequently used expressions which appeared in enemy R/T traffic (radar tracking of German reconnaissance aircraft, course and position of Allied fighters, altitude, check points, strength, etc.). Plans were made, and experiments begun, for communication with the reconnaissance aircraft by R/T.

This system of fighter warning proved very successful. With a limited use of personnel and equipment, reconnaissance crews could be supplied with data on the enemy fighter defense in very short order, and pilots were able to take appropriate evasive action in good time.

2. Fighter Warning From Enemy Radar Reporting Networks

Parallel in time to the system discussed above, a second method of giving fighter warning was developed from breaking the short messages sent by Allied radar stations, engaged in tracking German reconnaissance aircraft. The Allied radar networks situated in those areas where a German reconnaissance mission was to be flown, were monitored very closely by a W/T platoon of the company. The numerous messages intercepted were decoded, evaluated, and the results telephoned to the signal officer of the reconnaissance Gruppe. The latter, naturally, was also receiving, at the same time, all data obtained from Allied fighter R/T traffic, and was thus in a position to decide whether a German reconnaissance aircraft should be informed that it had been plotted by enemy radar. Usually these warnings were only transmitted to an

aircraft in the event of immediate danger, thereby preventing reconnaissance crews from becoming unduly alarmed, and breaking off their mission.

This latter type of fighter warning was not greatly appreciated by reconnaissance crews. Although it served to warn them of impending danger, it also served as a check on the reports which they rendered upon their return. Thus it frequently occurred that their statements were refuted by messages of the Allied radar service, causing them no little embarassment. By reading these messages, the Luftwaffe SIS could inform the reconnaissance Gruppe headquarters, even before the aircraft landed, of the exact routes taken on both the outward and return flights. Consequently, this type of SIS activity was looked upon with disfavor by German reconnaissance crews, since it meant that any defection on their part, in the face of an arduous mission, could be immediately detected.

EVALUATION OF RADIO TRAFFIC

OF THE

AMERICAN AIRCRAFT WARNING SERVICE

By

Lieut. Martin Ludwig,
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1. General

Ever since the arrival of American troops in North Africa W/T traffic of mobile Signal Aircraft Warning units was intercepted. Reports of aircraft movements were broadcast continually from the time the radar sets picked up the aircraft until they were out of range, apparently for the information of the fighter and flak defense. In some cases only enemy or unidentified aircraft were reported, and in others all aircraft, Allied as well, were included. The evaluation of this traffic brought valuable results for the German SIS.

2. Structure of the Messages

Small differences occurred according to the theatre involved, but in principle the reports took the following form:

t81 pr p9012 h w 10 a8

Key:

t81 = target number 81 (new series daily)

pr - course (see Figure No. 4)

Example of an Aircraft Reporting Compass for Course Reporting

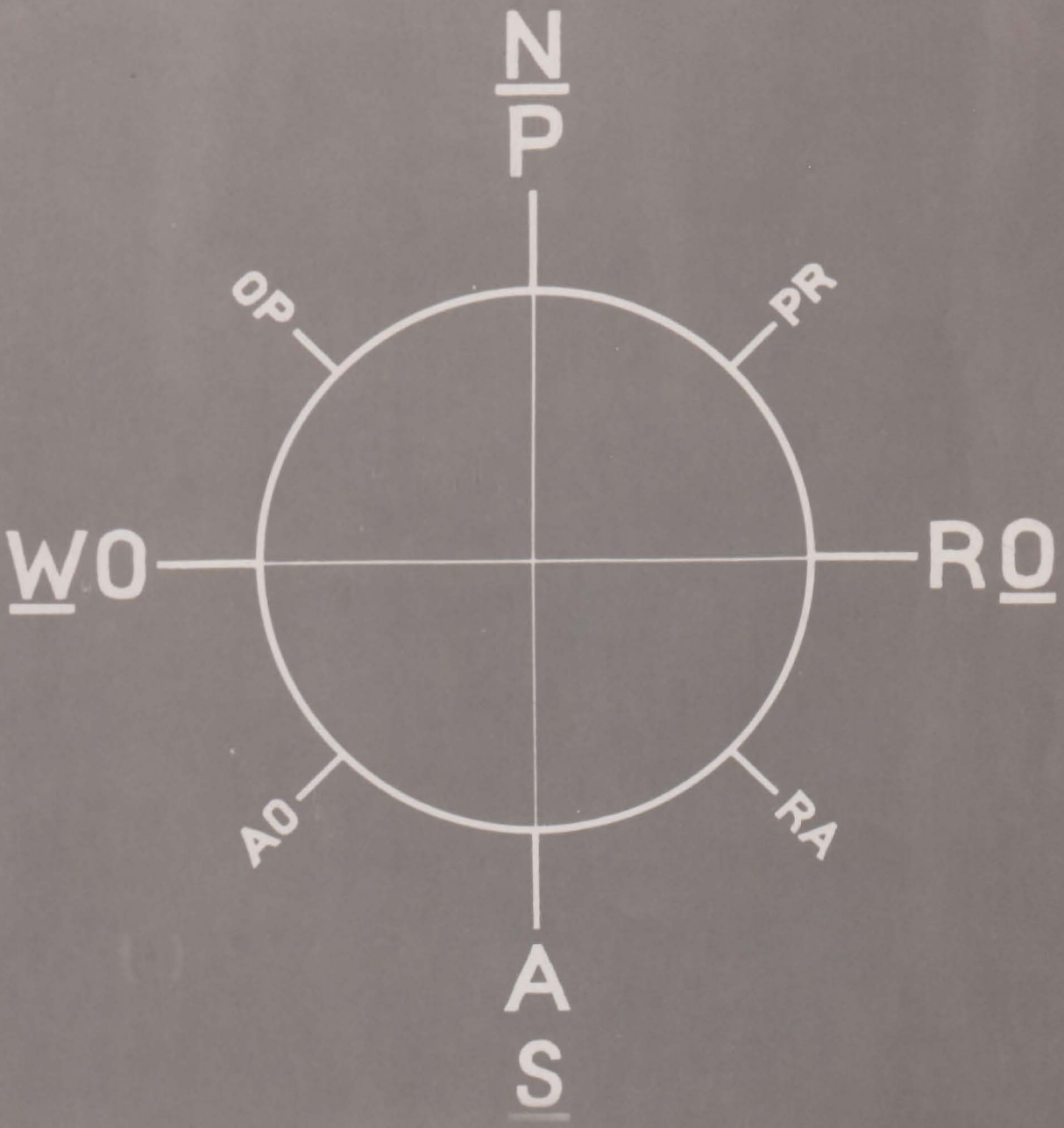

Figure No. 4

p9012 - British co-ordinates for position of aircraft or formation reported (see Figure No. 5)

h - hostile or f - friendly, or x - unidentified

w10 - 10 vessels or 10 aircraft

a8 - 8 angels (altitude)

The formation or the aircraft picked up, was reported continuously until passing out of range of the apparatus. Several formations could be reported at the same time. For example of this see Figure No. 6.

3. Evaluation of the Messages

a) Tactical Evaluation

If the formation picked up was German then the SIS passed on by way of the proper SI-liaison officer the warning "You have been spotted by enemy aircraft reporting service." If the formation was an American or British one, on its way to a mission, Flak and Fighter Control were given warning. This was a frequent occurrence. Especially after the occupation of France these reports were often the only way of knowing in good time of the approach of an enemy bomber formation. Several successful missions of the German night fighter arm are to be credited to this circumstance. The covername for these reports was "Wildkatze" (wildcat).

b) Strategic Evaluation

Each report from a given SAW installation was indicated by a dot on a British reporting grid. These maps were made up daily. Assuming there was sufficient air activity and a sufficient number of messages, they indicated the following:

Plotting of Individual Reports for Tactical Evaluation

(tracing aircraft movements)

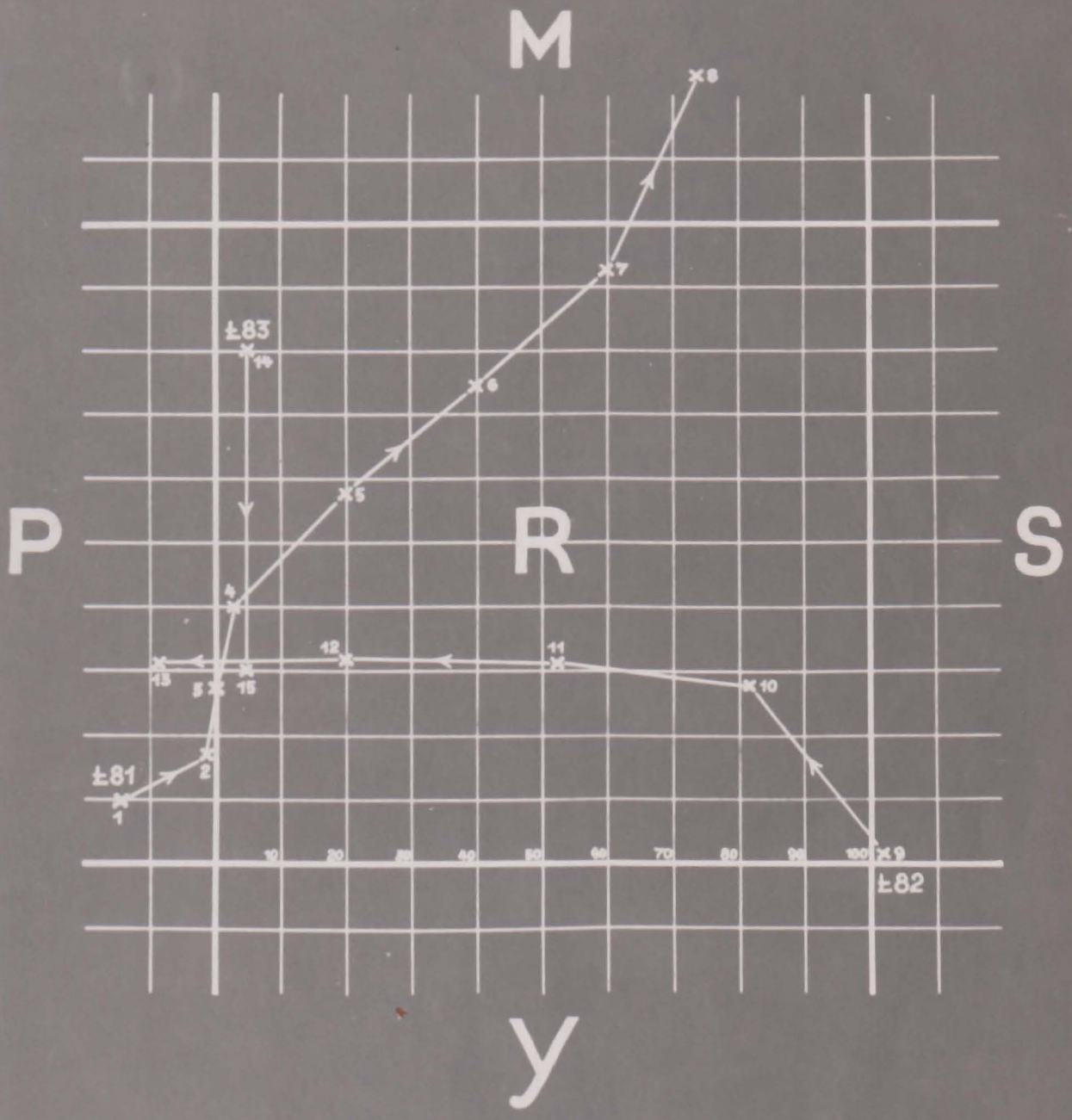

Figure No. 5

aa) Position of the radar installation.

In the vicinity of the installation there was always the greatest density of dots. Because of the "blind spot" directly above the radar, there would be a white spot (see Figure No. 7), which revealed the position of the apparatus.

bb) Range of the radar.

Once the position of the apparatus was established it was easy to determine the range, by the farthest dot.

cc) Defiladed areas due to terrain features. These were chosen by German formations for determining their course to target, particularly in the Italian theatre.

dd) Changes in position of installations.

A station going off the air for a short time, and picking up again at a different spot. The massing before attacks (as for example the Anzio landing) made it possible to determine the intentions of the enemy.

FIGURE NO. 6

Examples of running reports:

1. (x) t81 pr p 9012 h w10 a8
2. (x) t81 pr p 9918
9. (x) t82 op s 0100 f w1 a3
10. (x) t82 op r 8128
3. (x) t81 p r 0028
11. (x) t82 o r 5131
4. (x) t81 p r 0340
14. (x) t83 q r 0681 x w2 a4
12. (x) t82 o r 2031
5. (x) t81 pr r 2059
6. (x) t81 pr r 4075
13. (x) t82 o p 9431
7. (x) t81 pr r 6091
8. (x) t81 pr m 7018
15. (x) t83 q r 0630 f w2 a3

(parts of message following the position were included in subsequent messages only in cases of addition or correction)

See Figure No. 5 for plots of the courses of targets 81, 82, and 83.

(x) - Indication of the individual plots on Figure No. 5.

Plotting of Air Raid Warning Reports for Strategic Evaluation-

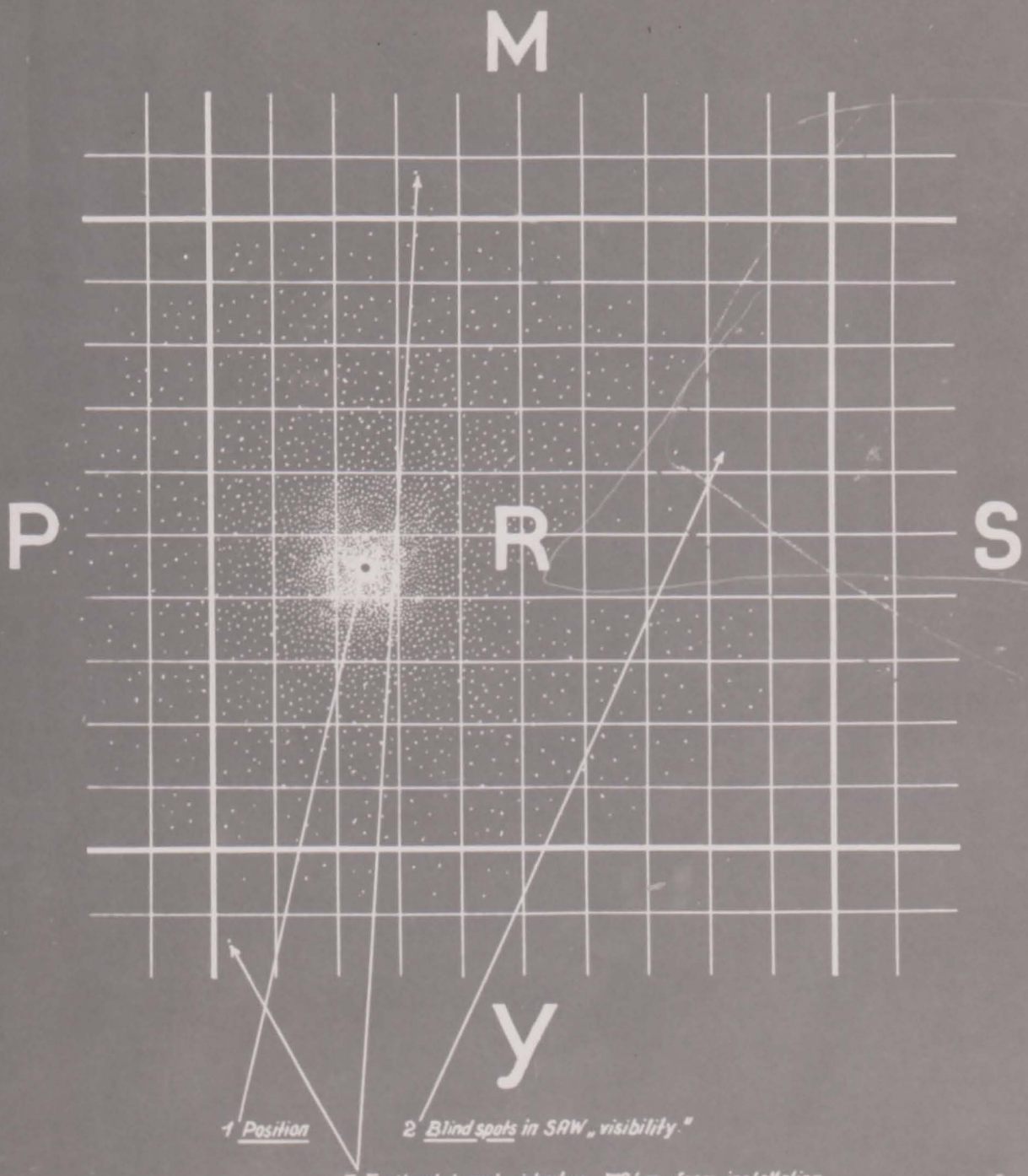

Figure No. 7